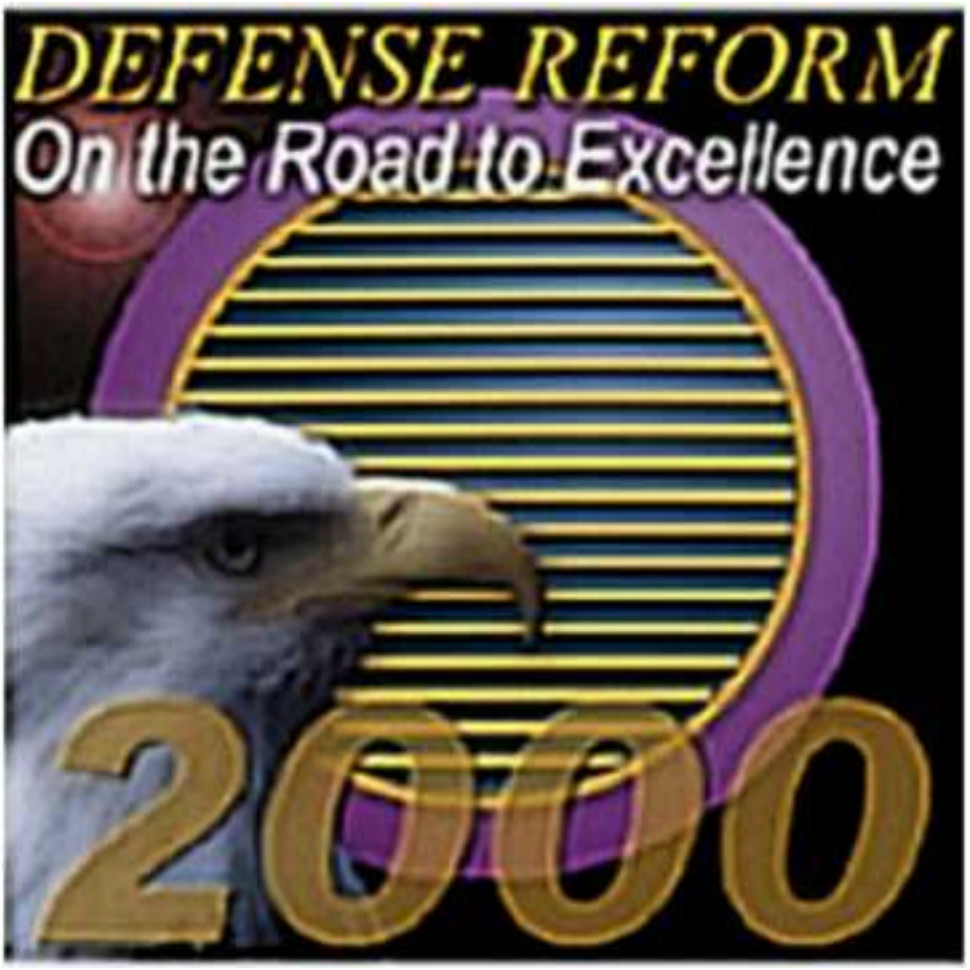

Electronic Commerce Conference

Performance Measures Working Group

Issue Paper

Introduction

Performance measures for Electronic Business and Electronic Commerce (EB/EC) are needed to measure return on investment, the progress of the EB/EC initiative, and to understand and identify areas of opportunity for improvement. "EB/EC" refers to the application of EB/EC techniques and solutions to the Department of Defense (DoD) business processes, including all DoD functional areas.

This issue paper establishes a framework to facilitate the creation of meaningful performance measures for EB/EC, which can be applied to any functional domain within DoD.

Background

A kick-off meeting of the Electronic Commerce Conference Working Groups (ECCWG) collaborative initiative was held 10 September 1999 at the Pentagon. The goal of the four working groups is to accelerate the implementation of EB/EC within DoD. This issue paper reports the results and recommendations of the Performance Measures working group (See Table 1-1).

The Government Performance and Results Act (GPRA) and the Information Technology Management Reform Act (ITMRA) both require that agencies set goals and performance measures for major programs and information technology initiatives. EB/EC initiatives should comply with the principles set out in these two public laws.

The performance of EB/EC should be measured to record the success or shortcomings of the items being addressed against established departmental goals and objectives. The performance driven measures being developed focus on quantifying the degree of success for each attribute. Proper application of performance measures will determine whether or not a goal is being met, as well as identify opportunities for improvement.

The EB measures focus on a closed loop feedback cycle consisting of investment, usage, and outcomes resulting from EB. Investments influence the usage of EB within DoD. The EB usage impacts the EB outcomes where the true efficiency gains are recorded. Outcomes are identified as cycle time, error rate, transaction cost and inventory cost. DoD can reinvest "savings and cost avoidance" into new technologies and reengineered items, which have a positive effect on the customer base, resulting in further usage and savings. (see Figure 1-1)

As DoD evolves to an EB/EC environment it must adopt industry-best commercial practices wherever possible. Accomplishing this task will help to accelerate the implementation of the civil military integration initiative.

Table 1-1. Performance Measures Working Group Team Members

NAME	ORGANIZATION
Mr. Howard Stern, Steering Group Support	Co-chair, Federal Electronic Commerce Coalition
Mr. Brice Zimmerman, Co-chair	CACI, Inc.
Mr. Bill Gorham, Co-chair	JECPO (retired)
Mr. Carl L. Berry, Co-chair	JECPO
COL Lyndi Balven, USAF	SAF/AQCI
Dr. Shawn Bohner	Meta Group
Mr. Edward F. Burke	Andersen Consulting
Mr. Jim Harrison	Meta Group
Mr. Chris Kreiler	CACI, Inc.
Mr. Lee Nash	Joint Staff/IRMO
Mr. Bill Ortengren	DCIO/ITAL
Dr. D. Brent Pope	PWC
Mr. D. B. Propert	JECPO
Mr. Kirk Rosener	Technology Mgmt Applications
Mr. W. Deane Stanley, III	Vector Research Inc
Mr. Alan Williams	Andersen Consulting
Ms. Linda Hutchison, Consultant support	LMI
Mr. Larry Klapper, Consultant support	LMI

PROBLEM STATEMENT

Although the benefits of EB/EC are clear, measuring implementation and benefits can serve to support further investment and provide quantitative feedback. A framework of measures to track the investment, usage, and outcomes of EB/EC is therefore required.

DISCUSSION

The methodology applies performance measures across a balanced scorecard

perspective based on the Department's progress on a business continuum. The continuum defines the maturity of EB/EC while the scorecard shows measures appropriate to a given perspective. The balanced scorecard performance measures and goals are based upon the Department's level of EB/EC maturity along the continuum.

.

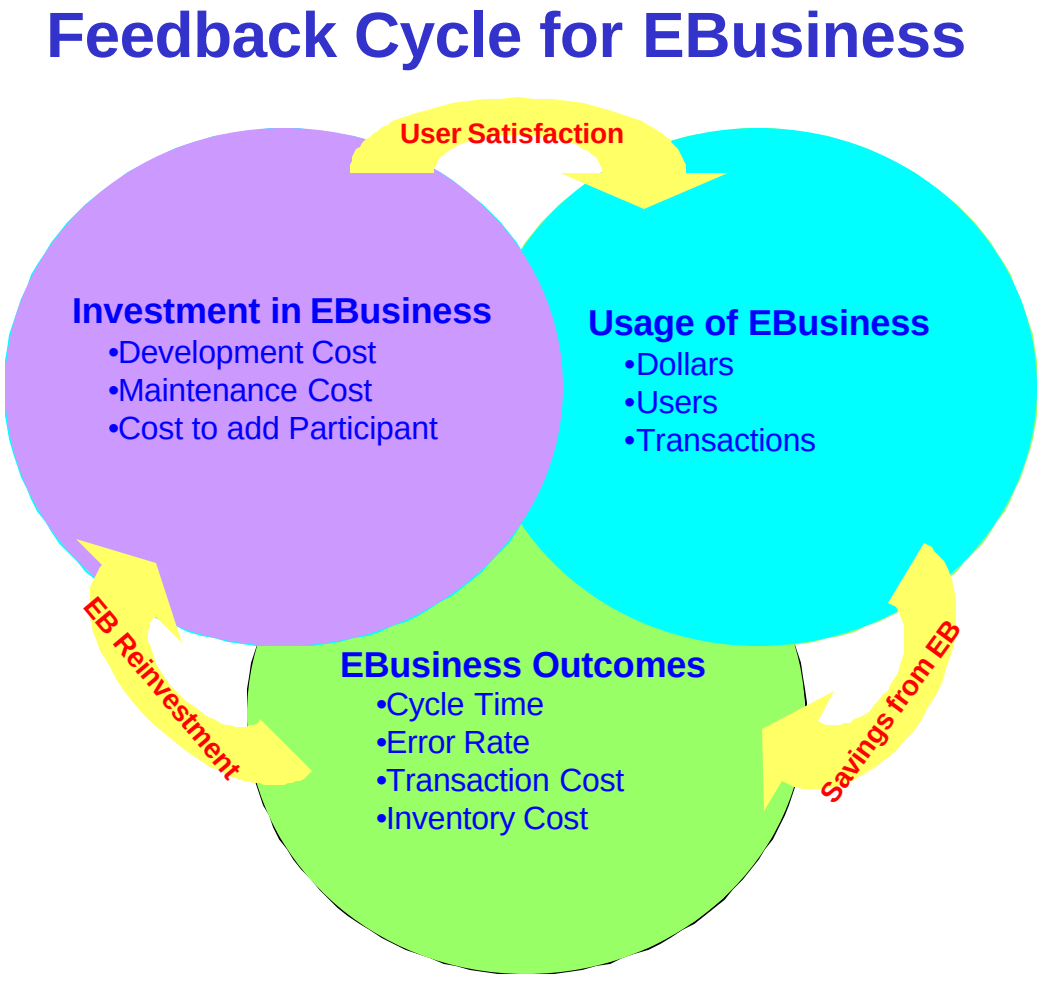

Figure 1-1. Feedback Cycle for EBusiness chart

Business Continuum

The electronic business continuum advances the concept of EB/EC beyond the customary perceptions of purchasing and paying using standard transaction sets. The new continuum represents EB evolution from a relatively narrow focus on areas as simple as web publishing, through an automated "access and transaction" capability for core processes, to a tightly integrated shared data environment. The continuum not only allows access, but also identifies areas requiring improvement and redefinition of core processes.

The continuum is based on the presumption that organizations grow in their use of EB/EC to support their processes over three distinct phases. The continuum is structured so that an organization can evolve from Phase 1 to the more complex Phase 3. As shown in Figure 1-2, each phase has a goal coupled with categories of complexity and elements to further define the measures. The measures remain constant throughout the phases (see Table 1-2).

Note that continuum reflects another aspect of the model… that is, the web publishing tends to be directed at a general audience while the IDE is directed at specific participant's needs. The information conveyed on the left-hand-side of the diagram will more than likely be generalized for broader consumption while the information on the right-hand-side will be more tailored or personalized. The value and complexity of the interaction goes up significantly as you move towards the right. Therefore, the measures should in some way reflect this.

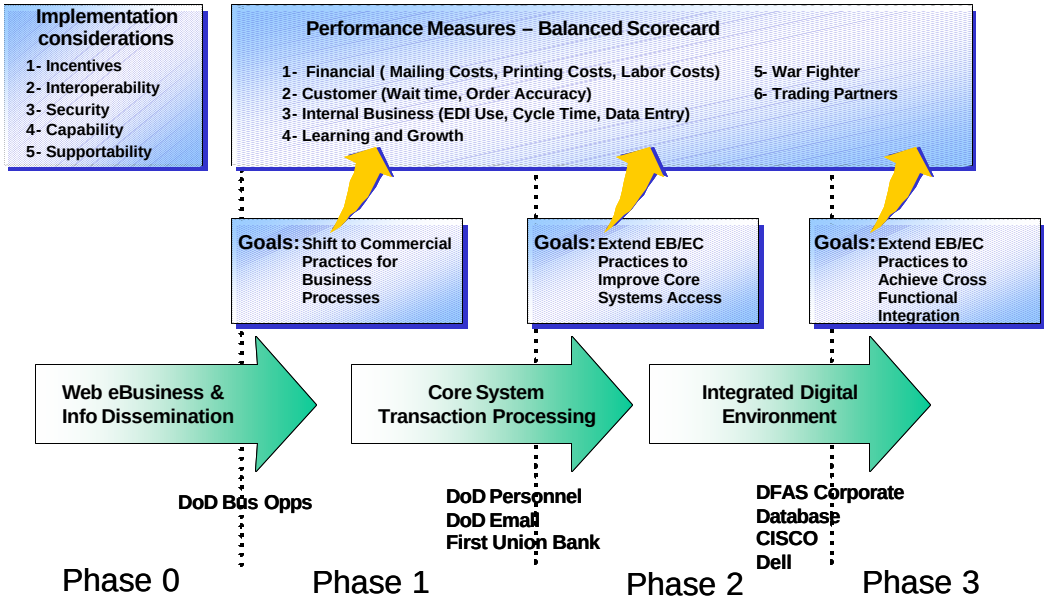

Figure 1-2. Use of the EB/EC Continuum

The Phase 1 technology and process involves using the Internet internally and establishing a website. Technology implementation should be based on a reexamination and reengineering of core processes. Phase 2 involves allowing access to core systems or allowing transactions on core systems. The third phase involves improving core business processes or redesigning core processes to create a seamless environment. The main emphasis should be on business process improvement using technology as an enabler.

Category	**Phase I -** Web EBusiness & Info Dissemination **Measures**	**Phase II** - Core System Transaction Processing **Measures**	**Phase III** - Integrated Digital Environment **Measures**
Efficiency measures	cycle time	cycle time	cycle time
	error rate	error rate	error rate
	transaction cost	transaction cost	transaction cost
EBusiness Investment	cost to reengineer and develop EB systems and methods	cost to reengineer and develop EB systems and methods	cost to reengineer and develop EB systems and methods
	cost to maintain EC systems	cost to maintain EC systems	cost to maintain EC systems
	cost to add participant	cost to add participant	cost to add participant
EBusiness Usage	Dollars	Dollars	Dollars
	Users	Users	Users
	Transactions	Transactions	Transactions
Corollary Savings	inventory costs	inventory costs	inventory costs
User Satisfaction	Help Desk calls	Help Desk calls	Help Desk calls
	Change requests	Change requests	Change requests
	Usage volume	Usage volume	Usage volume
Capabilities		Develop a transaction	Develop a transaction
		Manage a transaction	Manage a transaction
	Manage reference data	Manage reference data	Manage reference data
		Provide performance support	Provide performance support
	Control access to and protect transactions and reference data	Control access to and protect transactions and reference data	Control access to and protect transactions and reference data
	Transmit and translate transactions and reference data	Transmit and translate transactions and reference data	Transmit and translate transactions and reference data

Table 1-2 EB Measures

The main accomplishment in Phase 1 is publishing with customer and supplier communication both occurring one way. The main accomplishment in Phase 2 is interacting and transacting. This allows all access to core systems and allows transactions on core systems, respectfully. The customer communication is two-way and the supplier communication is one-way. The main accomplishment

in the Phase 3 is integration and transformation. This improves the core business process and redefines core processes, respectfully. The customer and supplier communications are both two ways.

A Balanced Scorecard Perspective

Traditionally, many Federal agencies have measured their organizational performance by focusing on internal or process performance, looking at factors such as the number of full-time equivalents (FTE) allotted, the number of programs controlled by the agency, or the size of the budget for the fiscal year. In contrast, private sector businesses usually focus on the financial measures of their bottom line: return-on-investment, market share, and earnings-per-share. Neither approach provides the full perspective of an organization's performance, yet managers make optimal decisions using both financial and non-financial measures.

Robert S. Kaplan and David P. Norton developed a measurement framework that they refer to as "a balanced scorecard." Managers use this framework to gain a quick yet comprehensive view of the organization's performance. The Balanced Scorecard considers both process and outcome measures in an attempt to balance between competing organizational objectives. A successful implementation of this approach focuses organizational performance monitoring in a manner that balances cost and employee commitment against customer satisfaction in the utility of the end product/service meeting their needs.

Kaplan and Norton suggest managers gather information within four performance perspectives: customer, financial, learning & growth, and internal business processes. We modified this approach to include two more perspectives: warfighter, and trading partner. Employee empowerment is considered a part of the learning and growth perspective. (See Figure 1-3). The goals of each perspective are cross-related to and support the goals presented in the DoD EB/EC Strategic Plan which are:

- Achieve global flexibility, increase productivity, and a dynamic working environment through the application of EB/EC
- Achieve efficient and effective responses to changing environment by the rapid introduction of business process improvement or reengineering and the exploitation of EB/EC technologies
- Achieve cultural changes and shifts from current business practices through guidance and the attainment of necessary skills for implementation of EB/EC.

A balanced scorecard offers a framework to measure the organization's short-term and long-term ability to meet its enterprise level goals through the identification and assessment of performance drivers and outcome. It balances the results of internal process measures with external stakeholder measures to drive toward the desired goal.

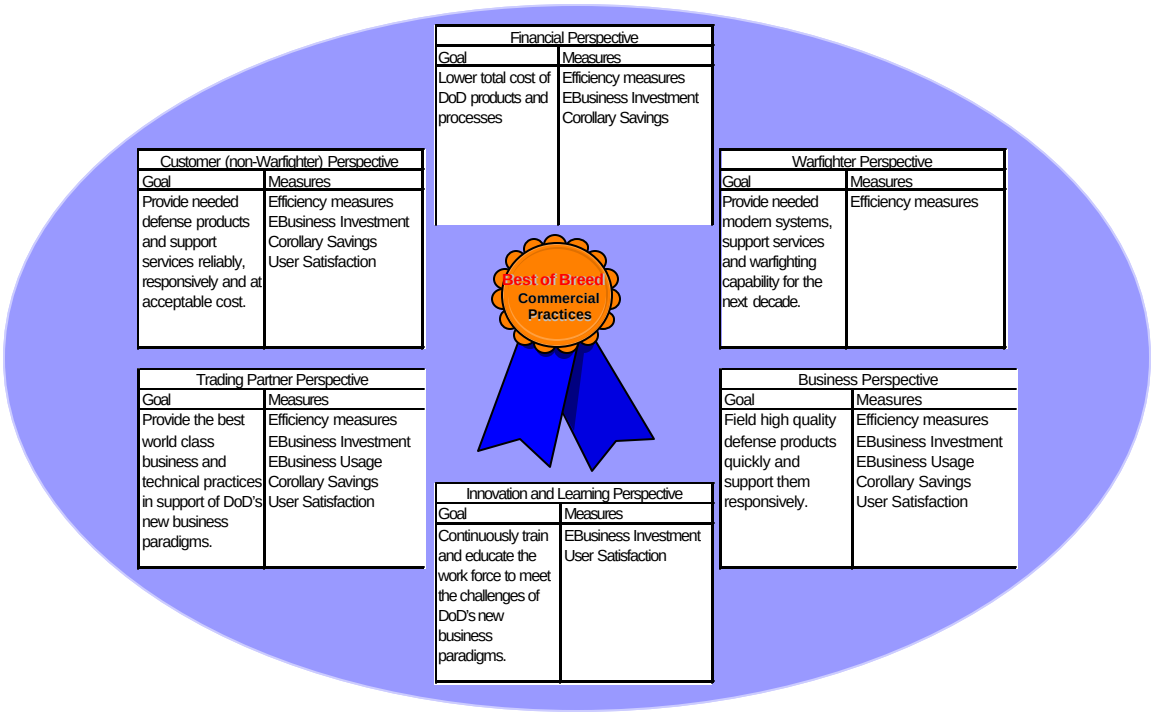

Figure 1-3. Balanced Scorecard Perspectives

The Balanced Scorecard and the Business Continuum Matrix

Each Business continuum area requires an organization to meet goals before moving to the next phase of EB/EC implementation complexity. Organizations recognize their ability to satisfy these goals based on the performance measures at each milestone. The measures are balanced across the balanced scorecard perspectives as presented in Figure 1-3.

The measurement baseline for the NULL or beginning state, i.e., Phase 0 may prove difficult to establish. This is due to a lack of process oriented measures for the manual processes. In these instances, measures should be taken from data that is currently being used and available.

Example

The first step in the process of establishing performance metrics is to develop mission goals based on the organization's EB maturity along the continuum, and link those goals to operational metrics.

Figures 1-4 and 1-5 provide a sample guide to setting goals for a project. As a system

matures over time, the gross cost of the process it supports should fall and usage should rise. Introduction of a newer generation of technology should enable further reductions in costs, increases in capabilities, and movement along the business continuum. Goals should be set appropriate to the system objectives and level of maturity.

An example of appropriate measures may be applied to the payment process, modeled by the Defense Reform Initiative Directive Number 47, To-Be End to End Procurement Process Team. For efficiency measures, the cycle time from invoice submission to being ready for payment can be used as well as the number of data entry errors. The cost to develop and maintain the systems used is easily measured. Cost to add a participant is chiefly attributable to the cost of managing user access and authentication. Usage of the electronic payment process can be measured in terms of the number of payments made, the number of dollars involved, and the number of vendors using the electronic system

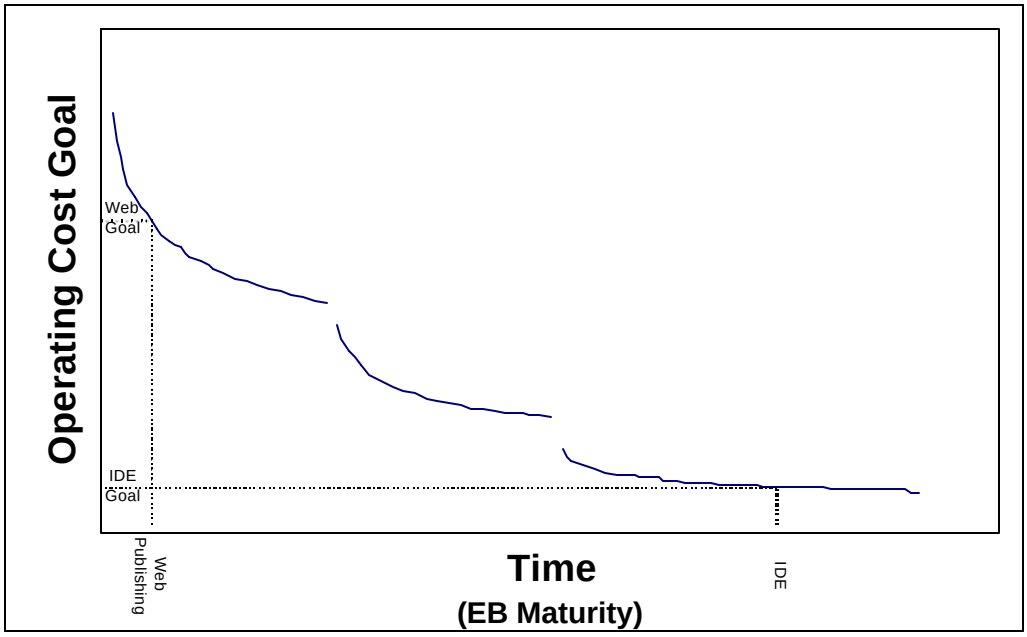

Figure 1-4 Operating Cost Goal Setting

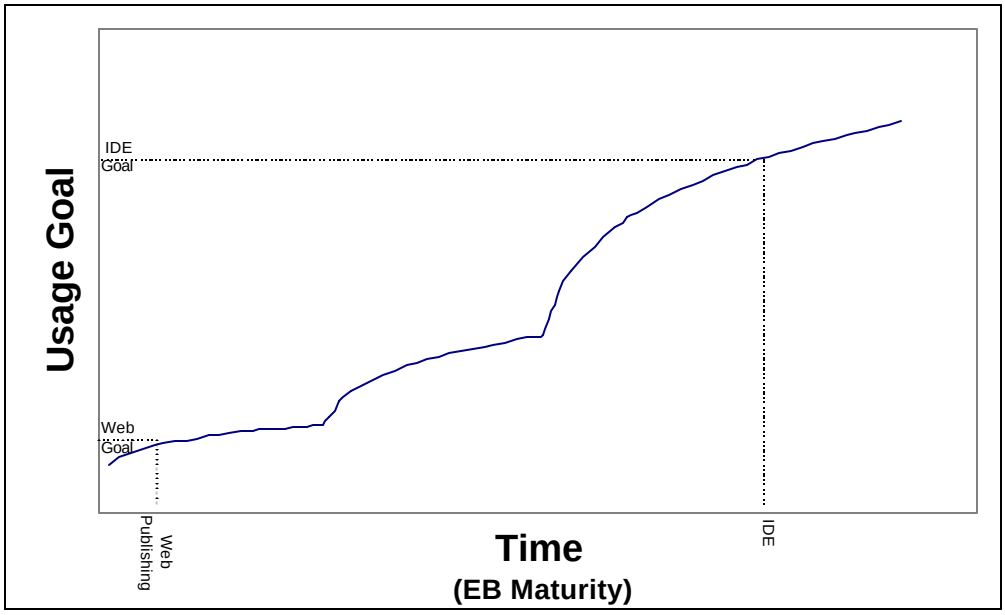

Figure 1-5 Usage Goal Setting

Recommendations

- Require EB/EC initiatives to establish goals and metrics;
- Require business areas to examine current processes, and cross functional requirements, and develop appropriate metrics in accordance with the proposed;
- Insert business area analyses into evolving EB/EC Architecture.

Implementation Concerns

The vast number of processes and organizations potentially affected by EB/EC would require a significant effort to develop and implement global EB/EC measures throughout DoD. The Performance Measurement Group found that DoD performance measurement approaches and mechanics differ greatly from industry based on a comparison with industry examples. Global measurement attempts have been tried with only marginal success in DoD previously. Therefore, a more incremental approach is recommended. Insofar as investment decisions need to be made at the project level, rather than globally, measures should be developed accordingly. Therefore, specific projects should use this framework to develop measures appropriate to the project's goals and processes prior to implementation. For example, the Paperless Contracting WIPT established measures of usage by transaction count for certain critical contracting steps in order to measure progress toward the goal of 90% paperless contracting by January 2000.

Measurement programs are supposed to support the decisions made at different levels in the organization. Scorecards are normally suited for executive level

decisions and convey business types of indicators where attention is being paid by the key decision-makers. An organization embarking on a EB/EC scorecard should start simple with a hand full of indicators tied to key mission statements and advance to more sophisticated measures as they become confident in the use of the scorecard instrument. Ultimately, from the EB/EC perspective, the scorecards should be tied to the reports used in managing the on-going tasks of the program.

Data collection should be an integral part of the EB systems such that it is transparent to the user. Organizations should be careful that they do not impose new reporting requirements solely for the sake of measuring progress in implementing EB.

As in all technology implementation (including performance measures), the right balance of integrating multiple data technologies must be achieved with respect to a set of targeted process requirements or the implementation will fail. Employee commitment to new processes will only come about if they believe the new process will allow them to perform their jobs faster or more effectively than a paper based process. Applying measures to the new processes will indicate how well the requirements are being implemented.

Resource Implications

By using an incremental approach, measurement resource costs can be controlled. Projects can and should build measurement tools into the project and include these costs in their budget estimates. Project managers should be careful to ensure that the investment in measures and planning is not disproportionate.

Those overseeing EB/EC investment and activities should be properly staffed and empowered to manage investment decisions.

Note: Additional information and data may be derived from the Incentives Group surveys. The Performance Measurement Group views performance measurement and incentives as two areas that are tightly coupled.